

Revision of the cluster flies of the *Pollenia haeretica* species-group (Diptera, Calliphoridae)

KNUT ROGNES

University of Stavanger, Faculty of Arts and Education, Department of Early Childhood Education, NO-4036 Stavanger, Norway.
E-mail: knut@rogn.no or knut.rogn.no@uis.no

Abstract

The Palaearctic *Pollenia haeretica* species-group is revised. Two species make up the group: *Pollenia haeretica* Séguy, 1928 (Algeria, Tunisia, Italy) and *Pollenia ibalia* Séguy, 1930 (Morocco). *Pollenia rungsi* Séguy, 1953 is established as a junior synonym of *Pollenia ibalia* Séguy, 1930, **syn. nov.** *Pollenia funebris* Villeneuve, 1933 is treated as a junior synonym of *Pollenia ibalia* Séguy, 1930, **syn. nov.**, but the name is a junior primary homonym of *Pollenia funebris* Robineau-Desvoidy, 1863, and therefore permanently invalid. A lectotype is designated for *Pollenia haeretica* Séguy to fix the interpretation of the name. The syntypes of *Pollenia funebris* Villeneuve are probably lost.

Key words: Diptera, Calliphoridae, *Pollenia*, cluster flies, revision, new synonyms, Palaearctic Region

Introduction

In earlier papers I have revised the following Palaearctic species-groups in *Pollenia* Robineau-Desvoidy: the *P. labialis* group (originally called the *P. intermedia* group) (Rognes 1987a); the *P. rudis* group (Rognes 1987b); the *P. semicinerea* group (Rognes 1988); the *P. viatica* group (Rognes 1991b; see also Rognes & Baz 2008); the *P. vagabunda* group (Rognes 1992a) and the *P. venturii* group (Rognes 1992b). These and other Palaearctic species-groups were defined and keyed, and their phylogenetic relationships examined by Rognes (1988, 1992b). Contributions to the knowledge of the morphology and the nomenclature of *Pollenia* species were also given by Rognes (1991a, 1991c). Contributions on the *P. tenuiforceps* group were given by Szpila (2000) and Rognes (2002), while Szpila and Draber-Mońko (2008) contributed on the *P. amentaria* species-group. Pioneering work on the *Pollenia* first instar larvae was published by Szpila (2003).

Several species-groups have not been fully revised: the *P. amentaria*, *P. griseotomentosa*, *P. japonica* and *P. tenuiforceps* species-groups. Revisionary work on the *P. haeretica* species-group was begun by the author during a visit to MNHN back in 1990. Recent captures of specimens of *Pollenia haeretica* on Sardinia (Italy) by Pierfilippo Cerretti and his team (cf. Rognes, in press) prompted me to finish it.

Methods

Acronyms for collections.

BMNH	The Natural History Museum, London, United Kingdom.
CNBF	Corpo Forestale dello Stato, Centro Nazionale per lo Studio e la Conservazione delle Biodiversità Forestale, Verona, Italy.
CNC	The Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Ontario, Canada.
IRSNB	Institut Royal des Sciences Naturelles de Belgique, Bruxelles [Brussels], Belgium.

KR	Private collection of Knut Rognes, Stavanger, Norway (ultimately to be transferred to the Oxford University Museum of Natural History, Oxford, United Kingdom).
MNHN	Muséum national d'Histoire Naturelle, Paris, France.
MRAC	Musée Royal de l'Afrique Centrale, Tervuren, Belgium.
SMNS	Staatliches Museum für Naturkunde, Stuttgart, Germany.
ZIN	Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.
ZMUC	Zoological Museum, Natural History Museum of Denmark, University of Copenhagen, Copenhagen, Denmark.
ZMUK	Christian-Albrechts-Universität zu Kiel, Zoologisches Institut und Museum (Sektion Biologie), Kiel, Germany.
USNM	Department of Entomology, Smithsonian Institution, National Museum of Natural History, Washington, DC, USA.

Abbreviations. *acr*—acrostichal setae; *dc*—dorsocentral setae; *h*—humeral setae; *ia*—intra-alar setae; *kepst*—katepisternal setae; *npl*—notopleural setae; *ph*—posthumeral setae; *prst*—presutural setae; *a*—anterior; *ad*—antero-dorsal; *av*—antero-ventral; *d*—dorsal; *p*—posterior; *pd*—postero-dorsal; *pv*—postero-ventral; *v*—ventral; ST—abdominal sternites; T—abdominal tergites.

Terminology. Morphological terms have been taken from Rognes (1991a).

Photography. Photographic methods are described in Rognes (2009).

Geography. Modern versions of old names for localities in Algeria and Morocco dating from the French colonial period have been traced in *The Times Comprehensive Atlas of the World*, on Google Maps, and on Wikipedia. A “Douar Ras el Ksar” locality was found in Morocco in Google Maps which I take to be the same as “Ras el Ksar”, the type locality of *Pollenia ibalia* Séguy (1930: 148), the noun “Dou'ar” meaning “A village composed of Arab tents arranged in streets” [cf. <http://www.thefreedictionary.com/Douar>]. The true height above sea level for the [Douar] Ras el Ksar locality in the Moyen Atlas Mountains of Morocco was found in Google Earth to be 900m as stated on the labels of Séguy's syntypes (Fig. 25, leftmost label), not 1900m as given in the text (Séguy 1930: 148).

Genus *Pollenia* Robineau-Desvoidy

Pollenia Robineau-Desvoidy, 1830: 412. Type species: *Musca rudis* Fabricius, 1794: 314 by original designation. For a comprehensive list of generic synonyms and a diagnosis of the genus, see Rognes (1991a).

Diagnosis and description of the *Pollenia haeretica* species-group

Body. Ground colour black. **Head.** Antennal pedicel and sometimes scape and extreme base of first flagellomere yellowish. Facial ridge, area below lower end of parafacial, area in front of genal dilation, and area behind vibrissal corner reddish. Anterior end of genal groove (between genal dilation and lower eye margin) also sometimes reddish. Frontal vitta brownish-black in male, with thin layer of greyish microtomentum, otherwise bare. In female the frontal vitta reddish anteriorly. Fronto-orbital plate, parafacial, and genal dilation covered with silvery-grey or brownish-grey microtomentum, with conspicuous shifting spots, especially on parafacial. All setae and setulae black, even all setulae at occiput. No pale setulae at lower end of postgena or elsewhere. Ocellar setae strong and almost parallel. Male frons strikingly broad, 0.100–0.158x head width at narrowest point. Female frons 0.339–0.392x head width at vertex. Male with inner vertical setae at most very slightly longer than innermost postocular setae, outer vertical setae not differentiated. Female with strongly developed inner and outer verticals. Fronto-orbital plate much narrower than frontal vitta, with 8–10 (male) or 6–7 (female) frontal setae, foremost one at level of anterior end of scape, hindmost ones very short and weak. Female with 2 proclinate and 1 laterocline orbital setae; no such setae in male. A single row (male) or several rows (female) of short setulae outside the row of frontal setae. Parafacial with 3–4 irregular rows of strong setulae, setulae at most as long as the width of the first

flagellomere, the setulae more densely set and even longer in upper part at level of anteriormost frontal seta. The setulae also invade the area below the parafacial and in front of the genal dilation. Lunula bare, depressed in the hind part. Facial carina very prominent with an anterior edge that is slightly convex in profile view. Antennal grooves deep. Vibrissae high above lower facial margin, distance between the right and left vibrissae about the same as or less than the distance between lower end of the facial carina and the ventral edge of the lower facial margin. Palpus black. Antenna with first flagellomere twice as long as pedicel; arista with shining brown stalk and long hairs above and below all the way to the apex, longest hairs about as long as width of first flagellomere.

Thorax. Dorsum with thin weak and uniform greyish microtomentum, more conspicuous at the anteriormost parts, thin narrow vitta present between the *acr* and *dc* rows on presutural area. Under some lights there are dark and broad vittae also between *acr* rows and outside of *dc* rows. Almost all specimens examined are without the thin curly yellow or golden type of setulae usually present in *Pollenia* species. In very few cases such setulae are present in low numbers on dorsum. This applies to some females of *P. haeretica*, and to the male holotype of *P. ibalia*, but not to other *P. ibalia* specimens. Ground setulae black, scarce on dorsum, here sometimes curly at tip. 2+3 *acr*; 2+3 *dc*; 1+1 *kep**st*; 1 *pr**st*; 3 *h* in a straight row; 1–2 *ph*, outer *ph* very often weak, absent, or asymmetrically developed; 1+2 *ia*; 2 *npl*, notopleuron also with long setulae; 4 strong marginal and 1 weak discal scutellar. Pleuron with black erect ground setulae on all sclerites, also on katapisternum. Behind the vertical row of anepisternal setae there are only black setulae. Proepisternal depression (“propleuron”), prosternum and metakatepisternum bare. Postalar wall with bundle of black setulae. Coxopleural streak long and narrow, almost reaching katapisternum. Katepimeron (“barrette”) setulose. Anterior and posterior spiracles with dark brown lappets.

Wing. Tegula and basicosta black. Subcostal sclerite brown, usually with microtomentum only (in one case a small setula present). Wing membrane and wing veins dark brown proximally, paler brown distally. Cell r_{4+5} usually open, rarely closed in margin or even with a short stalk. Second costal sector bare below. Both calypters white, with white marginal rims, rims with fringe of white very short setulae. Setulae at fold between upper and lower calypter long and brownish. Lower calypter sometimes infuscated, but a basal circular area remains white. Halter with a black or dark knob.

Legs. Fore tibia with a full row of strong *ad* setae and 2 *pv* setae at middle. Mid tibia with 2 *ad*, 1 strong *v*, 1–2 *pd* and 2–3 *p* setae; the strongest *p* seta at level with the *v* seta, both slightly distal to the strongest *ad* seta. Mid femur with 2–3 *pd* preapicals in a transverse row, with (female) or without (male) an *a* preapical seta; and black *pv* ground vestiture. Hind tibia with 1–3 *av* setae of which the lowermost is about as long as tibial diameter and the other ones much shorter, 2–4 *ad*, 2–3 *pd* setae. Hind femur with black *pv* ground vestiture. Tarsi about as long as tibiae on all legs.

Abdomen. Covered with a thin layer of greyish microtomentum, shifting along a middorsal line so that one half appears all grey and the other all dark according to lighting and angle of view. In most cases the grey and darker halves are almost totally uniform, but often there are a few irregularities so that there are small dark areas in the grey half, and vice versa. 2–4 lateral and no median marginal setae on T1–3. Complete marginal rows of setae on T4 and T5. Irregular transverse rows of discal setae on T5. *Male*. T1–4 dorsally with short more or less erect ground setulae, ventrally with similar but longer erect ground setulae, about as densely set as dorsally. T5 dorsally with much longer ground setulae than on T1–4 and with a transverse row of discal setae. *Female*. Decumbent, very closely adpressed ground setulae on T1–5 both dorsally and ventrally, though somewhat more semierect dorsally on T5.

Male genitalia. Surstyli longer than cerci, curving towards midline in anterior part in posterior view. Tip of cerci with more or less conspicuous brush of yellow or brown setulae. Aedeagus without a median hypophallic lobe; with short (narrow) ventral plates which have a regular smoothly curved distal edge; and with long low triangular hypophallic lobes, strongly sclerotised and denticulate posteriorly (proximally). Proximal edge of hypophallic lobes inserted well in front of ventral plates. Mesohypophallic rod long, rather broad in dorsal view, its proximal end smoothly connected to and continuous with ventral plate. Paraphallic processes of right and left side separated all the way from the base of the ventral plate, armed with a row of minute teeth distally.

Female genitalia. Not known for *P. ibalia*. For description of the ovipositor and internal reproductive organs of *P. haeretica*, see below under that species.

Recognition. The *P. haeretica* species-group is keyed by Rognes (1992b). Males are easily separated from all other Palaearctic species of *Pollenia* by the very broad frons in combination with a well developed facial carina and presence of a more or less dense brush of short setulae on the tip of the cerci. Females have also relatively broad frons (e.g., compared to females of *P. venturii*) and a similar facial carina, but safe assignment of single females is not possible at present.

Dark Palaearctic *Pollenia* species with a weakly dusted or shiny thorax and abdomen can be separated on external features from members of the *P. haeretica* species-group as follows.

Pollenia alajensis Rohdendorf (= *P. sytshevskajae* Grunin, cf. Rognes 1987a, 1988) (Kyrgyzstan, Kazakhstan) which has a distinct facial carina and all katapisternal ground setulae black, has an extremely narrow frons in the male (slightly less than width of anterior ocellus) and, like all males of the *P. tenuiforceps* group species, a hind tarsus that is a little shorter than the hind tibia (Grunin 1970, Rognes 1992b) and a hind tibia that has more or less complete rows of long *ad* and *pd* setae and a slightly shorter row of long *av* setae. In addition the hind tibia has (1) a ground vestiture on the *ad* surface that is short (about as long as or slight shorter than the width of the tibia), regular, almost erect, and often appearing as if combed backwards; (2) often a similar regular, semi-erect and even shorter ground vestiture on the *v* surface; and (3) a characteristic long and thin preapical *d* seta, about 3/4x length of the basal tarsomere. These three features of the *P. alajensis* male hind tibia are shared with the *P. tenuiforceps* group members *P. dasypoda* Portschinsky and *P. similis* (Jacentkovský), but in *P. tenuiforceps* Séguéy itself usually only feature (3) is typically developed. Both sexes of *P. alajensis* have a halter with a yellow knob. Note that *P. alajensis* is the only *P. tenuiforceps* group member that has a black shining thorax and abdomen [4 male and 3 female paratypes of *P. sytshevskajae* in ZIN, 2 male paratypes of *P. sytshevskajae* in SMNS, and 1 male in BMNH examined].

Pollenia amentaria (Scopoli) (Europe, Algeria) has yellow katapisternal ground vestiture, a higher number of scutellar marginals (5–6), a bright yellow wing base and an abdomen that is very shiny, with even less microtomentosity than *P. haeretica* species-group members. Halter with a yellow knob.

Pollenia atramentaria (Meigen) (Europe, Georgia) lacks a facial carina, has yellow katapisternal ground vestiture, a row of small setulae on the dorsal side of stem vein and a bright yellow wing base.

Pollenia leclercqiana (Lehrer) (Europe, Morocco) has a very narrow frons, 1–2x width of the anterior ocellus only, black katapisternal ground vestiture, 5–6 scutellar marginals, a wing base that is light brown, a wing cell r_{4+5} that is conspicuously stalked and an abdomen that is very shiny, with even less microtomentosity than *P. haeretica* species-group members. Halter with a yellow knob. The tip of the cerci have an ornamentation, but not as conspicuous as in *P. haeretica*.

Pollenia mystica Rognes (Georgia) is described as having “[p]arafacial hairs inconspicuous”, a dark pedicel “reddened only apically” and has only a single *pv* seta on fore tibia (Rognes 1988: 322).

Pollenia paragrunini Rognes (Armenia) likewise has only a single *pv* on fore tibia (Rognes 1988: 325).

Pollenia venturii Zumpt (Europe) shares with *P. haeretica* and *P. ibalia* an almost total absence of yellow crinkly *Pollenia* setulae in both sexes, but has a much less prominent facial carina, and a decumbent and very closely adpressed ground vestiture on the abdominal tergites T3–4, even in males, whereas the ground vestiture is almost erect in males of *P. haeretica* and *P. ibalia*, a feature overlooked in my paper on the *P. venturii* species-group (Rognes 1992b). In females each fronto-orbital plate is narrower than half the width of the frontal vitta.

Biology of the *Pollenia haeretica* species-group

Almost nothing is known about the biology of the species making up the *P. haeretica* species-group. Séguéy (1953) reported that a specimen of *Pollenia ibalia* Séguéy (as the holotype of *P. rungsi* Séguéy) had been bred from the noctuid moth *Laphygma exigua*, now most often carrying the name *Spodoptera exigua* (Hübner) and also known as the cotton moth, armyworm or beet army worm (Capinera 2006). Capture dates of the material studied are from March, April, May, June, August and September. No immatures are known.

Key to males of the *Pollenia haeretica* species-group

- 1 Cerci broad in dorsal view (Fig. 4); apex appearing truncated (Fig. 4), slightly upturned in lateral view (Fig. 5) and covered with a very conspicuous and very dense brush of brownish setulae (Fig. 6). In lateral view the long erect setae present on the dorsal surface of the cerci proceed distally all the way to the tip (Fig. 5). Pregonite a broad-based triangle in lateral view (Fig. 3). Frons at narrowest / head width ratio 0.121–0.158.....1. *Pollenia haeretica* Séguy
- Cerci narrow in dorsal view (Fig. 19); apex long, pointed (Fig. 19), not upturned in lateral view (Fig. 20) and covered with an inconspicuous, sparse brush of yellowish setulae (Figs. 21, 28). In lateral view the long erect setae present on the dorsal surface of the cerci are absent on the distal half (Fig. 20). Pregonite narrower, distally with almost parallel edges (Fig. 18). Frons at narrowest / head width ratio 0.100–0.108.....2. *Pollenia ibalia* Séguy



FIGURES 1–10. *Pollenia haeretica* Séguy, male (1–5 from “Tunisia, 10 km N Korba ...” specimen in ZMUC; 6, 9 from “Sorgono, Sardegna ...” specimen in BMNH; 7–8, 10 from lectotype of *Pollenia haeretica* Séguy in MNHN). 1. Aedeagus, left lateral view. 2. Tip of paraphallic process (large magnification). 3. Pre- and postgonites. 4. Cerci and surstyli, posterior view. 5. Cerci, surstyli, epandrium and bacilliform sclerites, left lateral view. 6. Tip of cerci (large magnification). 7. Head, dorsal view. 8. Facial region, from in front. 9. Abdomen, oblique view. 10. Four original labels and K.R.’s label referring to MNHN slides.

1. *Pollenia haeretica* Séguy, 1928

Figs. 1–15, 30.

Lectotype male, Algeria (Skikda [“Philippeville”] [36°54' N, 6°57' E]) (MNHN), here designated. For details, see Type material, below.

Pollenia haeretica Séguy, 1928: 374 [justified emendation of the incorrect original spelling *haeretica* (with a ligature of the letters a and e; cf. Code Articles 27, 32.5.2 and 33.2.2), ICZN 1999].

Note. The name *haeretica* was mentioned in this paper only in a key to species of *Pollenia* Robineau-Desvoidy. Since accompanied by diagnostic characters, the name is available from this publication, although no indication was given that the name was used to denote a new species. Neither was information provided about the number or sex of the specimens before Séguy, or about localities of capture.

Pollenia haeretica: Séguy, 1930: 146, 148, 149 [as *haeretica*].

Note. Here *haeretica* was included in a key to *Pollenia* species (p. 146), and elsewhere (in text on p. 149 and in fig. 97 on p. 148) compared to *Pollenia ibalia* Séguy which was described as a new species in this paper. Still no information was provided about the specimens upon which the name *haeretica* was based, their number, sex or where they had been captured. Séguy illustrated (fig. 97) the tip of a cercus (labelled “fe”, and termed “extrémité apicale d’une branche du forceps externe”) and the pregonite (labelled “g”, and termed “une gonapophyse antérieure”) both obviously prepared from a microscope slide of the genitalia (Fig. 30).

Pollenia haeretica: Séguy, 1934: 45, 46, 47, 49.

Note. Again, *haeretica* was entered in a key to *Pollenia* (p. 46), and its aedeagus described (p. 47) and figured in lateral view (fig. 16 on p. 49). On p. 45 (fig. 4) was given a small, low quality sketch of the tip of the cercus with its dense vestiture. Localities were provided (p. 49), but no information was provided about the number of specimens or their sex.

Pollenia haeretica: Séguy, 1941a: 21, 23, 25, 26 [as *haeretica*].

Note. Séguy again keyed *haeretica* (p. 21) and mainly repeated the information in his 1934 paper. A figure of the aedeagus with details of the tip of the paraphallic process (fig. 22 on p. 23) was provided together with a figure of the tip of a cercus (fig. 21) (now termed “extrémité d’une branche du forceps interne”, although in his 1930 paper the term “forceps externe” was used). The latter figure (fig. 21) resembles the sketch published by Séguy (1934: fig. 4 on p. 45) but the vestiture is shown much less dense.

Pollenia haeretica: Zumpt, 1956: 73.

Note. Zumpt did not see any specimens of *haeretica*, and copied Séguy’s (1934, 1941a) figure of the aedeagus (Textfig. 31, right hand figure).

Sachtlebeniola (Séguyiomyia) *haeretica*: Lehrer, 1963: 293.

Note. Lehrer grouped *haeretica* with *vagabunda* (Meigen), *contempta* Robineau-Desvoidy and *ibala* Séguy (error for *ibalia*).

Nitellia (*Trichopollenia*) *haeretica*: Lehrer, 1967: 258.

Note. Lehrer again grouped *haeretica* with *vagabunda* (Meigen), *contempta* Robineau-Desvoidy and *ibala* (error for *ibalia*) Séguy, although assigning them to other nominal genera and subgenera than in 1963.

Pollenia haeretica: Schumann, 1986: 46. Catalogue entry.

Pollenia haeretica: Rognes, 1992a: 97.

Note. Rognes did not accept that *haeretica* (and *ibalia* Séguy) belonged in the *vagabunda* species-group.

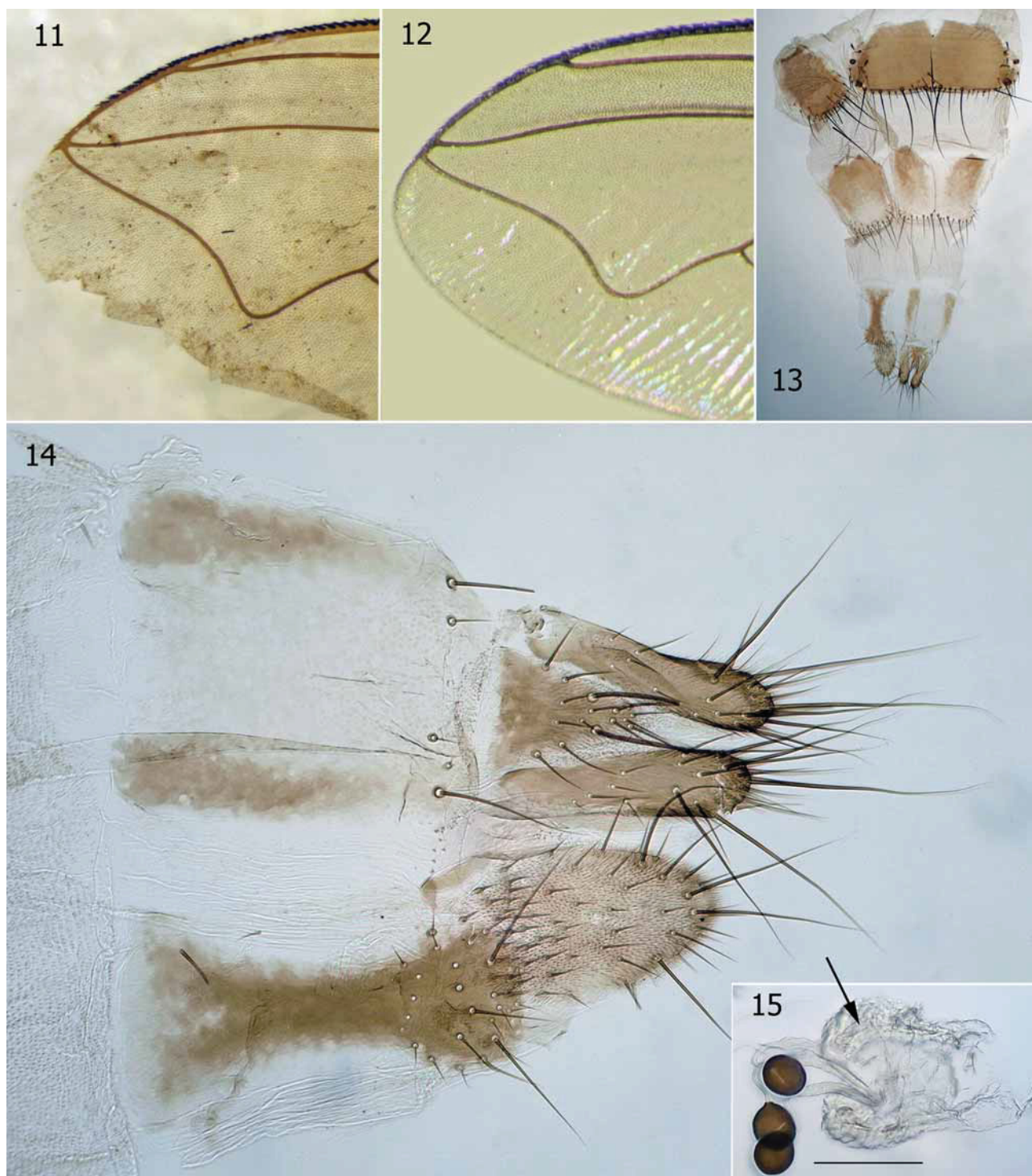
Pollenia haeretica: Rognes, 1992b: 235.

Note. Rognes keyed (p. 235) and characterised (p. 248) the *P. haeretica* species-group (p. 245) for two species, *P. haeretica* and *P. ibalia*, and provided a preliminary cladistic analysis of its relationship with other *Pollenia* species-groups.

Pollenia haeretica: Rognes, in press.

Note. Rognes recorded the species from several localities in Sardinia, which were the first published records of the species from Europe.

Diagnosis. *Male*. Length: 6–9mm (mean 7.3mm, n=11). **Head**. Frons at narrowest / head width ratio: 0.121–0.158 (mean 0.139, n=14). **Genitalia**. Cerci broad in dorsal view; apices appearing truncated, slightly upturned distally in lateral view and covered with a very conspicuous and very dense brush of brownish setulae at the inside of each tip. In lateral view the long erect setae present on the dorsal surface proceed distally all the way to the tip. Surstylus slightly narrowed in distal third and covered with short spiny setae on the external surface for its whole length, except at the extreme base where a couple of long setae are present and visible in dorsal view. There are also a few short spinous setae on the inside of the incurved tip. Pregonite a broad-based triangle in lateral view.



FIGURES 11–15. *Pollenia haeretica* Séguy male and female (11 from lectotype of *Pollenia haeretica* Séguy in MNHN, slide 289; 12 from male labelled “... Villacidro...14.XI.2006...” in CNBF; 13–14 from slide “G. pr. 314” made from dissected female paralectotype labelled “Philippeville...” in MNHN; 15 from glycerol preparation of the internal genitalia of the same female paralectotype in MNHN). **11.** Wing tip. **12.** Wing tip. **13.** Ovipositor, flat mount. **14.** Tip of ovipositor, flat mount. **15.** Uterus with lateral sacs and spermathecae; arrow points to lumen of a lateral sac. Scale = 0.25mm (Figure 15).

Female. Length: 5–9mm (mean 7.3mm, n=15). **Head.** Frons at vertex / head width ratio: 0.339–0.392 (mean 0.364, n=16). **Ovipositor** (Figs. 13, 14). T6 short, undivided, without microtrichiae on disc and along hind edge. ST6 with microtrichiae on disc in hind fifth. T7 with weakly sclerotised middle part narrower than

strongly sclerotised lateral halves, no microtrichiae anywhere on disc or along margin. ST7 also without microtrichiae except in a narrow zone around the marginal setae. Pleural membrane 7 microtrichiose. T8 with two narrow sclerotised lateral parts with a much broader weakly sclerotised in between, everywhere without microtrichiae; marginal setae a little in front of hind margin. ST8 narrow in middle, without microtrichiae. Pleural membrane 8 without microtrichiae. Epiproct microtrichiose. Cerci with microtrichiae in distal half, mostly along edges. Setae on epiproct and cerci of the long slightly wavy type, not spine-like. Hypoproct with microtrichiae all over and with short setae on disc and long setae along margin. (Two flat-mounted ovipositor slides examined, G.pr. 314, 315). **Internal reproductive system.** Spermathecae circular. Lateral sacs very slightly curved tubes with unsclerotised inner wall (Fig. 15).

Immatures. Unknown.

Biology. According to label data *P. haeretica* has been captured in the months of March, April, May, June, August, September. No breeding data are available.

Distribution. Algeria, Italy (Sardinia), Tunisia.

Material examined. Type material. *Pollenia haeretica* Séguy, 1928. The provenance of the material before Séguy was not published until his 1934 paper, where it was presented as follows “Algérie: Philippeville [now = Skikda] (Théry); Rocher-Blanc [now = ?], Rouiba [now in eastern part of the city of Alger], Alger (Surcouf)”. The last mention of Surcouf’s name obviously refers to specimens from Rocher-Blanc, Rouiba and Alger. These data were repeated by Séguy (1941a). The number and sex of the material have never been specified. I have traced all material in MNHN that possibly qualifies as syntypes of *haeretica*, and it is detailed below.

Specimens labelled with locality names corresponding to those listed by Séguy and placed under *haeretica* in the MNHN collection have been accepted *prima facie* as syntypes. In addition I have accepted as syntypes specimens from Algeria found under *haeretica* in MNHN carrying labels reading “... Dept. d’Alger / Fort de l’Eau / J. Surcouf 1921”, “...Boghari”, “... Algérie / Boghari / Coll. J. Surcouf 1919” and “Tadmit”, even though none of the localities Fort de l’Eau [now = Bordj El Kiffan, in eastern part of Alger], Boghari [now = Ksar el Boukhari, about 100km SSW of Alger] or Tadmit [between Laghouat and Djelfa, in the easternmost part of the “Saharien Atlas” mountains] have ever been published by Séguy for *haeretica*. However, I consider the fact that all specimens from these localities (except one, see next paragraph) were found under *haeretica* in the MNHN collection and all likely to have been known to Séguy, even very likely placed there by himself, constitutes “unpublished” evidence for considering them as being part of the type series, in accordance with Article 72.4.1.1 of the Code (ICZN 1999). This article allows that “[f]or a nominal species ... established before 2000, any evidence, published or unpublished, may be taken into account to determine what specimens constitute the type series.”

I have with some doubt also accepted as syntype a male from Boghari found under “*P. vespillo*” and which carries a single blue locality label identical to the one on a conspecific female found under *P. haeretica*. Likewise, I have accepted as syntype a female from Rouiba found in the collection under “*P. atramentaria*”, since it carries labels identical with those on a conspecific Rouiba male found under *P. haeretica* (including a white hand-written locality label with date of capture rendered as 15.5.12).

No type designation was made in the original publication of Séguy (1928) where the name *haeretica* was validly introduced. To fix the identity of the name *Pollenia haeretica* Séguy I have selected and labelled a lectotype (see below). I have labelled all the remaining syntypes with red paralectotype labels (*haeretica* Séguy). All the original syntypes are conspecific except for a female from Alger which belongs to *Phyto Robineau-Desvoidy* (probably *P. discrepans* Pandellé) (Rhinophoridae) (see below). All the paralectotypes have been given my determination label (20 *Pollenia haeretica* Séguy and 1 *Phyto discrepans* Pandellé).

Lectotype male, here designated, in MNHN, labelled (Fig. 10) (1) “PHILIPPEVILLE / ALGÉRIE / A. THERY” [printed on brownish label]; (2) “MUSEUM PARIS / ALGÉRIE / PHILIPPEVILLE / A. THÉRY 1903” [printed, except the “A” and the “3” in the last line, which are handwritten, a black frame around label]; (3) “TYPE” [black print on red label]; (4) “*Pollenia / haeretica / Séguy 1928 / TYPE.*” and [along the left side of the label] “2787” [all handwritten by Séguy on white label]; (5) “Prep. 289 / + 294 NB! / K. Rognes det.” [handwritten by K.R. except last line which is printed]. (6) My lectotype label (*Pollenia haeretica* Séguy).

The lectotype is in good shape and lacks the left wing. It has been dissected by Séguy, as witnessed by the abdominal tip which has the genitalia removed. In MNHN are two slides prepared by Séguy from this specimen. The first, slide no. 289, is a Canada balsam mount of the left wing being labelled “289 / Algérie / P / Correspond à / l’insecte 2787” [left side of slide] and “*Pollenia* / *haeretica* / Séguy / Aile gauche du / TYPE 2787” [right side of slide] [both labels handwritten by Séguy]. The second, slide no. 294, is a Canada balsam mount of the ST5 and the genitalia, being labelled “294 / Algérie / Philippeville / A. Théry” [left side of slide] and “*Pollenia* / *haeretica* / Séguy TYPE. / Correspond à / 2787” [right side of slide] [both labels handwritten by Séguy]. The number /2787 on both slides showed that they had been prepared from the lectotype which has the same number on its label. **Paralectotypes** (21 specimens, all in MNHN. Some MNHN specimens were badly damaged in transit when borrowed, and a few heads, legs and abdomens were broken off.): 5 females with labels identical to the two upper ones on the lectotype male (see above), and all pinned very high on the pins. One of them was dissected by K.R. in 1990, and carries two additional labels: (3) “G.pr. 314 / K. Rognes det. 90”; (4) “*Pollenia* ♀ ST / *haeretica* Ség. / K. Rognes det. 90” [both handwritten except for the text “K. Rognes det.” which is printed]. The head is pinned below the labels, and the abdomen had been glued to a card below the pinned head. Due to an accident in the mail the abdomen had come loose from the card and is now not recoverable from among the debris left in the box from the accident. The uterus and spermathecae are in glycerol in a glass microvial on the pin above label (3), and the ovipositor and ST1–5 flat-mounted in Euparal on a separate slide labelled «“Philippeville / Algérie / A. THÉRY” (1) / “.... 1903” (2) / MNHN Paris / Euparal» [left side of slide] and «G. pr. 314 / *Pollenia* ♀ / *haeretica* Séguy / SYNTYPE / ST1–5 / ovipositor / K. Rognes 25/3.90» [right side of slide] [both in K.R.’s handwriting] (also in MNHN). Two females are intact. A fourth female lacks the head. The fifth female has lost both the head and the abdomen. • 2 females labelled (1) “MUSEUM PARIS / ALGER / J. SURCOUF 1922” [printed on blue labels]; (2) “JUIN” and “AOUT”, respectively. The “AOUT” specimen is a rhinophorid and belongs to *Phyto* Robineau-Desvoidy, probably *Phyto discrepans* Pandellé. It has been given a label to this effect. • 3 males and 1 female labelled “ALGÉRIE / ROCHER-BLANC / (LE CORSO) / J. SURCOUF / MAI – JUIN 1912” [printed on yellowish label]. One of the males has been dissected by Séguy as witnessed by the abdominal tip which lacks the genitalia. I have given it a second label reading “Prép. / 290 / K. Rognes det.” [handwritten except for last line]. The number “290” refers to a slide in MNHN which is a Canada balsam mount of the ST5 and the genitalia of the dissected male. The slide itself is labelled “290” [left side] and “*Pollenia* / *haeretica* Séguy / TYPE” [right side] [both labels handwritten by Séguy], but the “TYPE” reference cannot be to the lectotype specimen. There is nothing written on the slide that connects it to the dissected specimen, except for the name. But the fact that it is the only dissected specimen of *Pollenia haeretica* in MNHN besides the lectotype proves that the slide no. 290 belongs to this specimen. The “TYPE” reference on the slide must have been put there before Séguy decided what specimen he would give the red “TYPE” label (which turned out to be the one labelled “2787”). • 2 males and 2 females all labelled “MUSEUM PARIS / ROUIBA / (DEP’ D’ALGER) / J. SOURCOUF 1923” [printed on blue label]. Of these 1 male and 1 female carry an additional label above the printed blue label reading “Rouiba / 15.5.12” [handwritten in Surcouf’s handwriting]. The male has been dissected by K.R., and the abdominal T1–5 are glued to a piece of card on the pin above the labels and the ST1–5 and the genitalia are kept in glycerol in a glass microvial pinned below the original labels. The female was found in the MNHN collection under “*Pollenia atramentaria*” together with a headless female of *Pollenia leclercqiana* (Lehrer), and a male and a female of *Pollenia venturii* Zumpt, all from France. 1 male and 1 female carry an additional label below the blue printed label reading “JUIN” [printed]. • 2 females labelled “MUSEUM PARIS / ALGÉRIE / Dépt d’Alger / Fort-de-l’Eau / J. SURCOUF 1921” [printed on yellowish label]. One of them was dissected by K.R. in 1990. The uterus (with an egg) and the spermathecae are kept in glycerol in a glass microvial on the pin. The abdominal T1–5 are glued to a card above the labels. The pin carries two additional labels: (2) “G. pr. 315 / K. Rognes det. 90” (3) “*Pollenia* ♀ / *haeretica* Ség. / K. Rognes det. 90” [both these labels handwritten except “K. Rognes det.” which is printed]. The ovipositor and ST1–5 are flat-mounted in Euparal on a separate slide labelled «“MUSEUM PARIS / ALGÉRIE / Dept. d’Alger / Fort de l’Eau / J. SURCOUF 1921” MNHN Euparal» [left side of slide] and “G. pr. 315 / *Pollenia* ♀ / *haeretica* Séguy / ST1–5 / ovipositor / K. Rognes 25/3.90» [right side of slide] [both in K.R.’s handwriting] (also in MNHN). • 1 male

and 1 female labelled “ALGERIE / Boghari” [printed on blue label, except last line which is handwritten]. The male carries an additional label reading “*Pollenia* ♂ / *haeretica* Ség. / K. Rognes det. 90” [handwritten except “K. Rognes det.” which is printed]. I dissected the male in 1990, and the abdominal T1–5 are glued to a piece of card on the pin above the labels and the ST1–5 and the genitalia are kept in glycerol in a glass microvial pinned below the red paralectotype label. The male was found in MNHN under “*Pollenia vespillo*” together with 1 male and 1 female of *Pollenia venturii* Zumpt from France and 2 females of *P. amentaria* Scopoli from Algeria (Rocher Blanc, Surcouf leg.). The female was found under *Pollenia haeretica*. • 1 male labelled “MUSEUM PARIS / ALGÉRIE / BOGHARI / Coll. J. SURCOUF 1919” [printed on yellowish label]. This male has the cerci and surstyli visible. • 1 female labelled (1) “TADMIT / AVRIL 1893” [printed]; (2) “MUSEUM PARIS / ALGÉRIE / P. LESNE 6-97” [printed on yellowish label].

Other material (all have been given my determination label (*haeretica* Séguy)). **BMNH**: 1 male labelled “Sardegna / Sorgono [in the Nuoro province of Sardinia] / Krausse” [handwritten] (dissected by K.R. 2 Oct 2009). **CNBF**: 1 male labelled “I, Sardegna (Medio Campidano) / Villacidro dint. P.ta Piscina Argiolas / Serbatoio 282m / UTM-WGS84 32S0472049 4360081 / 14.XI.2006 retino a vista / D. Whitmore leg. / Progetto Sardegna – CNBF”. The cerci and surstyli are visible. • 1 male labelled “I, Sardegna (Medio Campidano) / Villacidro, Torrente Leni 300 m / UTM-WGS84 32S 0471317 4360510 / 9.IX.2006, retino / (D. Avesani, M. Bardiani, D. Birtele / G. Nardi leg. / Progetto Sardegna – CNBF”. Note. The cerci and surstyli are visible. • 1 female labelled “ITALIA – Sardegna (OR) / Dune di Piscinas / 21.IX.2004 (retino) / P. Cerretti, M. Tisato leg.”. The locality is in the province Medio Campidano even though labelled as if from OR [= Oristano]; • 1 female labelled “I – Sardegna (Cagliari) / Arbus, Piscinas, dune / UTM-WGS 84 32S 0452927 4376897 / 21.IX.2004 retino / D. Birtele, P. Cerretti, E. Gatti / F. Mason, D. Whitmore legit”. The locality is in the province of Medio Campidano even though labelled as if from Cagliari; • 2 females labelled “I – Sardegna (Carbonia-Iglesias) / Domusnovas, lago Siuru, 322 m / UTM-WGS84 32S 0467069 4357916 / 20-23.V.2006 trappola Malaise / M. Bardiani, D. Birtele, P. Cornacchia / D. Whitmore legit / Progetto Sardegna – CNBF”; • 1 female labelled “I – Sardegna (Carbonia-Iglesias) / Domusnovas, Valle Orida, 592 m / UTM-WGS84 32S 0466973 4362228 / 2.V–16.V.2006, Malaise trap S3 / G. Chessa legit / Progetto Sardegna – CNBF”. **KR**: 1 male 1 female labelled “ITALIA – Sardegna (OR) / Dune di Piscinas / 21.IX.2004 (retino) / P. Cerretti, M. Tisato leg.”. Note. The male has the cerci and surstyli visible. The locality is in the province Medio Campidano even though labelled as if from OR [= Oristano]; • 1 female labelled “I – Sardegna (Carbonia-Iglesias) / Domusnovas, lago Siuru, 322 m / UTM-WGS84 32S 0467069 4357916 / 20-23.V.2006 trappola Malaise / M. Bardiani, D. Birtele, P. Cornacchia, / D. Whitmore legit / Progetto Sardegna – CNBF”. **ZMUC**: 1 male labelled (1) “TUNISIA / 10km N Korba / 29.iii.1986 / Zool. Mus. Copenhagen Exp.”; (2) “*Pollenia* ♂ / *ibalia* Ség. / K. Rognes det. 86”; (3) “*Pollenia* ♂ / *haeretica* Ség. / K. Rognes det. 90”; (4) “*Pollenia* (m) / *haeretica* Séguy / K. Rognes det. / 2009” [labels (2) and (3) are handwritten, except “K. Rognes det.” which is printed; label (4) is printed except “2009” which is handwritten]. Dissected by K.R. in 1990. Abdominal T1–5 glued to card above label, ST1–5 and genitalia in glycerol in glass microvial between labels (3) and (4). • 1 male labelled (1) “TUNISIA / Tabarka area / 7-18.v.1988 / Zool. Mus. Copenhagen Exp.”; (2) “*Pollenia* / *haeretica* / *ibalia* / Séguy / K. Rognes det.” [printed]; (3) “*Pollenia* (m) / *haeretica* Séguy / K. Rognes det.” [printed]. The cerci and surstyli are visible.

2. *Pollenia ibalia* Séguy, 1930

Figs. 16–30.

Holotype male, Morocco (Douar Ras el Ksar [“Ras el Ksar”] [33° 55' 42" N, 3° 50' 4" W] 900m, (MNHN), by original designation. For details, see Type material, below.

Pollenia ibalia Séguy, 1930: 146, 148.

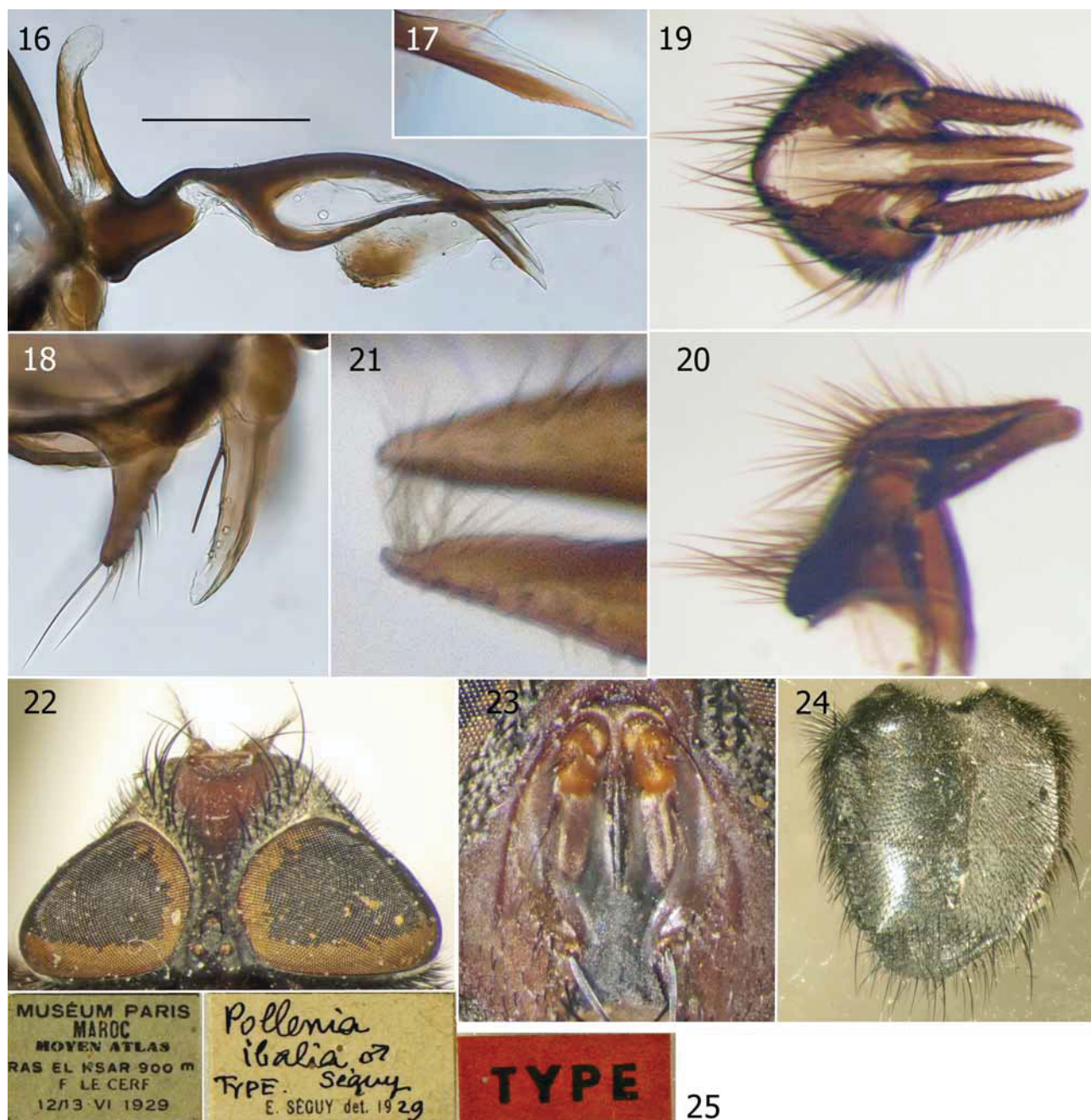
Note. *Pollenia ibalia* was given a place in a key (on p. 46) to *Pollenia* Robineau-Desvoidy in this paper, and some parts of the genitalia were described and figured (fig. 96 on p. 148) together with corresponding parts of *P. haeretica* (fig. 97). In text and figures Séguy compared his new *ibalia* with *haeretica* Séguy. Séguy illustrated the tip of a cercus (labelled “fe”, and termed “extrémité apicale d’une branche du forceps externe”) and the pregonite (labelled

“g”, and termed “une gonapophyse antérieure”) (Fig. 30). Details of the type material found in MNHN are given under Type material, below.

Pollenia funebris Villeneuve, 1933: 284. Morocco (Marrakech). Permanently invalid name, primary homonym of *Pollenia funebris* Robineau-Desvoidy, 1863: 664. **Syn. nov.**

Note. Tentative synonymy. The fate of the syntypes of this species is not known. They are not present in MNHN, or in CNC, IRSNB, MRAC, USNM or ZMUK, all housing Villeneuve types, and are possibly lost. The description and country of origin (Morocco) make it likely that they belong to *Pollenia ibalia* Séguy. The name was based on five specimens from Marrakech captured by “le D^r R. Meyer du 23 au 28 mars 1932”. Only males were described. Since the name is a primary homonym and thus permanently invalid, the true identity of the name is of academic interest only.

Pollenia ibalia: Séguy, 1934: 45, 46, 47, 49.



FIGURES 16–25. *Pollenia ibalia* Séguy, male (16–23, 25 from holotype in MNHN; 24 from specimen labelled “Asni ...” in BMNH). 16. Aedeagus, left lateral view. 17. Tip of paraphallic process (large magnification). 18. Pre- and postgonites. 19. Cerci and surstyli, posterior view. 20. Cerci, surstyli, epandrium and bacilliform sclerites, left lateral view. 21. Tip of cerci (large magnification). 22. Head, dorsal view. 23. Facial region, from in front. 24. Abdomen, oblique view. 25. Three original labels. Scale = 0.25mm (Figure 16).

Note. *Pollenia ibalia* was keyed (p. 46). The aedeagus was described briefly (p. 47) and figured in lateral view (fig. 15 on p. 49). The cerci (now termed “[f]orceps internes”) were described (p. 50) as “brusquement tronqués à l’apex avec quelques courtes soies serrées en pinceau apical” and roughly sketched (fig. 5 on p. 45). Localities were provided (p. 50). A printing error from Séguy (1930) about the altitude of the Ras el Ksar material is repeated.

Pollenia ibalia: Séguy, 1941a: 22, 23, 26.

Note. Séguy again keyed (p. 22) *P. ibalia* and mainly repeated information from his 1934 paper. The figure of the aedeagus with details of the tip of the paraphallic process (fig. 20 on p. 23) was copied from his 1934 paper, together with details of the tip of a cercus (fig. 19 on p. 23) (now again termed “extrémité d’une branche du forceps interne”, although in his 1930 paper “forceps externe” was used).

Pollenia rungsi Séguy, 1953: 88. Holotype male, Morocco (Rabat, bred from *Laphygma exigua* [= *Spodoptera exigua* (Hübner), Lepidoptera, Noctuidae]) (MNHN), by monotypy. Examined. **Syn. nov.**

Pollenia ibalia: Zumpt, 1956: 73.

Note. Zumpt did not see any specimens of *ibalia* and also copied Séguy’s (1934, 1941a) figure of the aedeagus (Textfig. 31, left hand figure).

Pollenia funebris: Zumpt, 1956: 82.

Sachtlebeniola (Séguyiomyia) *ibala* [error for *ibalia*]: Lehrer, 1963: 293.

Note. Lehrer grouped *ibalia* with *vagabunda* (Meigen), *contempta* Robineau-Desvoidy and *haeretica* Séguy.

Nitellia (*Trichopollenia*) *ibala* [error for *ibalia*]: Lehrer, 1967: 258.

Note. Lehrer again grouped *ibalia* with *vagabunda* (Meigen), *contempta* Robineau-Desvoidy and *haeretica* Séguy, although assigning them to other nominal genera and subgenera than in 1963.

Pollenia ibalia: Schumann, 1986: 46. Catalogue entry.

Note. Schumann, by an error, only cited the type locality as “Moyen Atlas, Berkine”.

Pollenia rungsi: Schumann, 1986: 47. Catalogue entry.

Pollenia ibalia: Rognes, 1992a: 97.

Note. Rognes did not accept that *ibalia* (and *haeretica* Séguy) belonged in the *vagabunda* species-group.

Pollenia ibalia: Rognes, 1992b: 235.

Note. Rognes keyed (p. 235) and characterised (p. 248) a *P. haeretica* species-group (p. 245) for two species, *P. haeretica* and *P. ibalia*, and provided a preliminary cladistic analysis of its relationship with other *Pollenia* species.

Diagnosis. *Male*. Length: 6–9mm (mean 7.5mm, n=3). **Head**. Frons at narrowest / head width ratio: 0.100–0.108 (mean 0.105, n=5). **Genitalia**. Cerci narrow in dorsal view; apices long, pointed, not upturned distally in lateral view, tip covered with an inconspicuous, sparse brush of yellowish setulae. In lateral view the long erect setae present on the dorsal surface of the cerci are absent on the distal half. Surstylus with long thin setae on the outside in basal half, visible in dorsal view. No short spiny setae on external side. Pregonite narrow, distally with almost parallel edges.

Female. Length: 6–9mm (mean 7.5mm, n=2). Frons at vertex / head width ratio: 0.364–0.383 (mean 0.374, n=2). **Ovipositor**. Unknown. **Internal genitalia**. Unknown.

Biology. According to label data *P. ibalia* has been captured in April, June and August. One specimen (the holotype of *P. rungsi*) is on record for having been bred from *Laphygma exigua* [= *Spodoptera exigua* (Hübner), Lepidoptera, Noctuidae]. No immatures are known.

Distribution. Morocco.

Material examined. Type material. *Pollenia ibalia* Séguy, 1930. Séguy (1930: 148) described *Pollenia ibalia* on the basis of material cited as follows: “Moyen Atlas: Berkine, 1350–1400m., jardins dans le Tlet n’Rhoir, 10.VI.29; type: Ras el Ksar, 1900 m, 12–13.VI.29 (F. Le Cerf)”. The number of specimens or their sex was not stated. No material from Berkine has been traced in MNHN, but there are three specimens labelled “... Ras el Ksar 900m F. le Cerf ...” and one of them carries Séguy labels indicating that this specimen was meant to be a name bearer. The cited “type” statement in conjunction with the red “TYPE” label and the word “TYPE” written on a second label (see below) fixes the status of this specimen as holotype by original designation. I have labelled it with a holotype label. Evidently Séguy’s 1900m is a printing error for the actual height of 900m. The other specimens have been labelled as paratypes. All specimens are conspecific, and I have labelled the paratypes with my determination label (*ibalia* Séguy). **Holotype** male, in MNHN, labelled (Fig. 25) (1) “MUSÉUM PARIS // MAROC // MOYEN ATLAS // RAS EL KSAR 900 m // F LE CERF // 12/13 VI 1929” [printed on greyish blue label]; (2) “TYPE” [printed on red label]; (3) “*Pollenia* / *ibalia* ♂ / TYPE. Séguy / E. SÉGUY det. 1929” [handwritten by Séguy except “E. SÉGUY det. 19” which is

printed]; (4) my holotype label (*ibalia* Séguy). The specimen has been dissected by K.R.. The abdominal T1–5 are glued to a card on the pin above the labels, and the ST1–5 and genitalia are kept in glycerol in a glass microvial below label (3). **Paratypes** (2 males, both in MNHN): 1 male labelled (1) “MUSÉUM PARIS // MAROC // MOYEN ATLAS // RAS EL KSAR 900 m // F LE CERF // 12/13 VI 1929” [printed on greyish blue label]; (2) “*ibalia* / E. Séguy det. 19” [handwritten by Séguy, except last line which is printed]; (3) “ag 292 / K. Rognes det.” [handwritten in pencil on white label, except last line which is printed; ag = appareil genital]; (4) “Genital slide / no. 292 / “*Pollenia ibalia* n.sp.”” [printed on red label; label prepared by K.R.]; (5) my paratype label (*ibalia* Séguy). Slide 292, also in MNHN, is a Canada balsam mount of the ST5 and the genitalia labelled “292” [left side of slide] and “*Pollenia / ibalia / n.sp.*” [right side] [all text in pencil in Séguy’s handwriting]. • 1 male labelled (1) “MUSÉUM PARIS // MAROC // MOYEN ATLAS // RAS EL KSAR 900 m // F LE CERF // 12/13 VI 1929” [printed on greyish blue label]; (2) my paratype label (*ibalia* Séguy). Not dissected, but cerci and surstyli clearly visible.



FIGURES 26–30. 26–29. *Pollenia ibalia* Séguy, male (from holotype of *Pollenia rungsi* Séguy in MNHN). 26. Aedeagus, left lateral view. 27. Aedeagus, dorsal (posterior) view. 28. Tip of cerci, slightly oblique view. 29. Three original labels, determination label and holotype label by K.R. 30. Right pregonite and tip of cercus of *P. ibalia* (left) and *P. haeretica* (right) [reproduced from Séguy 1930: 148, figs. 96 and 97, by permission].

Pollenia rungsi Séguy, 1953. This species was described from an unspecified number of males from Rabat (Morocco), bred from *Laphygma exigua* [= *Spodoptera exigua* (Hübner), Lepidoptera, Noctuidae] by “Ch. Rungs”, the data concerning the breeding being “..., élev. 1564, 19-XI-1935”. A single specimen was found in MNHN under *Pollenia rungsi*, labelled (Fig. 29) (1) “s [?] / Laphygma / exigua / El: 1564 / 19.xi.35” [handwritten] ; (2) “TYPE” [printed on red label]; (3) “*Pollenia / Rungsi / TYPE* Ség.” [handwritten by Séguy]. It is in good condition (but left wing is lost). I dissected it during a visit to MNHN in 1990 and added a label, (4) “*Pollenia* ♂ / *ibalia* Ség. / K. Rognes det.” 90” [handwritten, except “K. Rognes det.” which is printed]. The abdominal T1–5 were glued to a card above label (1), and the ST1–5 and genitalia kept in glycerol in a glass microvial between labels (3) and (4). The specimen fits the description and other published data and is obviously a name-bearing type. Even though Séguy did not state in the original publication that only one specimen was before him when he described *rungsii* and neither used the expression “holotype”, “le type”, “type”, or some equivalent expression in the published text, I interpret the single specimen in MNHN

as a holotype fixed by monotypy, in conformity with my action in similar cases regarding other Séguy species (*Bengalia unicolor*, *Bengalia chromatella*, *Bengalia pallidicoxa*) (Rognes 2009). I have labelled the specimen as such (Fig. 29).

Pollenia funebris Villeneuve, 1933. This species was described from five male specimens from Marrakech (Morocco). No syntypes are present in CNC (e-mail from J. O'Hara 16 April 2007), IRSNB (letter from P. Grootaert 7 January 1987; list of IRSNB holdings of various Villeneuve types), MNHN (letter from L. Matile 19 May 1987; personal visits in 1987, 1990); MRAC (e-mail from E. De Coninck 28 April 2010); USNM (not in list of holding of Villeneuve types received in e-mail from N. E. Woodley 14 February 2008) or ZMUK (letter from F. Sick 24 March 1987), all housing other Villeneuve types. The type material is possibly lost.

Other material. All have been labelled with my determination label (*ibalia* Séguy). **BMNH:** 1 male, staged on small clear plastic sheet, labelled “Morocco / Asni / viii.1930 / Prof.T.D.A.Cockerell.” [printed on yellowish label]; (2) “Pres. By / Imp. Inst. Ent. / B.M.1938-661.” [printed]; (3) “*Pollenia* / *ibalia* Séguy” [handwritten by ?]. Dissected by K.R. 2 Oct 2009. The abdominal T1–5 are glued to the stage, and the ST1–5 and genitalia kept in glycerol in a glass microvial below the original labels. **ZMUC:** 1 female labelled (1) “Morocco 1000 m / 15 km SW Tazenakht / 11.iv.1989 / Zool.Mus.Copenh.Exp.” [printed]; (2) “*haeretica* / *ibalia* // Séguy // K. Rognes det.” [printed]. • 1 female labelled (1) “Morocco 0–20 m / 40 km S Larache / 23–24.iv.1989 / (Zool.Mus.Copenh.Exp.”; (2) “*haeretica* / *ibalia* // Séguy // K. Rognes det.” [printed]. Note. Since it is not known by what features the females of *ibalia* differ from those of *haeretica*, these ZMUC specimens have tentatively been assigned to *ibalia*, mainly because of the provenance.

Note. There is a record of “*Pollenia ibalia*” from Morocco in Séguy (1941b: 33), from “Djebel M’Goun, cañon Tessaout, 3.000–3.200 m., 1–15 septembre”. I have traced the specimen in MNHN and it is a misidentified female of *Pollenia leclercqiana* (Lehrer). I have labelled it as such.

Discussion

Problems with Séguy’s papers. *Pollenia haeretica* and *P. ibalia* are rare species and have so far only been known from Séguy’s papers (1928, 1930, 1934, 1941a). They have been difficult to identify with any degree of confidence because of a certain lack of precision in Séguy’s keys and descriptions, apart from a confusing terminology, the cerci being sometimes called “forceps interne”, sometimes “forceps externe”. With the results of the present revision as background knowledge, some important problems with Séguy’s papers on these species will be discussed.

Facial keel of *P. ibalia*. This was described (Séguy 1930: 146) in successive key options leading to *P. semicinerea* Villeneuve and *P. ibalia* (and partly to other species) variously as “[c]arène faciale bien développée” and “[c]arène faciale épaisse”. In the main description of *P. ibalia*, however, Séguy (1930: 148) wrote: “Carènes faciales nulles, brunies à la base...”. It is confusing that the noun is put in plural here, the facial keel being a single structure. It is possible that he is referring to other structures than the facial carina, perhaps the facial ridges, since, a little further below, he wrote that the antennae were “séparées à la base par une carène aiguë aussi longue que l’antenne, ...”. In later papers the facial carina was again described as “bien développée” (Séguy 1934: 46, 1941a: 21). The facial keel is in fact very prominent and rather similar to the one in *P. haeretica* which is described variously as “saillante” (Séguy 1928: 374; 1930: 146) and “... aussi épaisse que l’antenne”, (Séguy 1934: 46; 1941a: 21) (compare Figs. 8, 23).

Wing cell r_{4+5} . In Séguy’s first key (Séguy 1928: 374) there is an option for a wing character reading “Aile: première cellule postérieure fermée, à pétiole court”, as opposite to the option where this wing cell is “largement ouverte”, where *P. haeretica* is grouped together with *P. atramentaria* Meigen. While *P. atramentaria* specimens have a short stalk to the cell r_{4+5} , this key option does not apply to all the specimens of *P. haeretica* in MNHN. If we disregard the paralectotype female from Alger which is a rhinophorid (the cell is stalked, and the specimen possibly belongs to *Phyto discrepans* Pandellé), there are three type specimens that have the cell closed in margin (the lectotype male [Fig. 11], a female paralectotype from Alger and a female

paralectotype from Rocher-Blanc) and two female paralectotypes which have the cell with a short stalk (both from Fort de l'Eau, one of them dissected by K.R.). The remaining paralectotypes have the cell open. Among the other specimens examined, unavailable to Séguy, there are two females from Sardinia in CNBF that have the cell with a short stalk. All other specimens I examined have the cell widely open, as in Fig. 12. Such specimens of *P. haeretica* will key out to *P. semicinerea* or *P. contempta* Robineau-Desvoidy in Séguy's (1928) key. The later keys by Séguy (1930, 1934, 1941a) included the species *P. ibalia*, and in these keys the *P. haeretica* specimens with a widely open cell r_{4+5} will come out as *P. ibalia*, because of their wide frons and the presence of 2 *ad* setae on the mid tibia. The three syntypes of *P. ibalia* have a widely open cell r_{4+5} , but the right wing (the only one present) in the holotype of *P. rungsi* has this cell closed in the wing margin. So both *P. haeretica* and *P. ibalia* vary in this feature.

Number of ad setae on the mid tibia. This feature is described by Séguy (1930: 149) when comparing his new species *P. ibalia* with *P. haeretica*. He states that *P. ibalia* has two *ad* setae on the mid tibia, while "... (une seul est présente chez le *P. haeretica*), ...". However, this is inaccurate as far as *P. haeretica* is concerned. Of the specimens in MNHN only the lectotype and a male (dissected) and a female from Rouiba have 1 *ad* on the mid tibia. The remaining specimens in MNHN, all specimens in BMNH, CNBF and KR, and all specimens in ZMUC, except one, have 2 *ad* setae on the mid tibia, in so far as this leg is intact (most specimens). One male specimen in ZMUC has 3 *ad* on the left and 4 *ad* on the right mid tibia. All *P. ibalia* specimens I have seen have 2 *ad* on mid tibia, except the male in BMNH which has 2 *ad* on the left, one *ad* on the right mid tibia, although it is possible that a second *ad* has been lost (very difficult to decide whether a basal pore is present or not).

Vestiture on tip of cerci. This is figured by Séguy for both *P. haeretica* and *P. ibalia* three times (Séguy 1930: figs. 96, 97 on p. 148; 1934: figs. 4, 5 on p. 45; 1941a: figs. 19, 21 on p. 23). The 1930 figures are very detailed (Fig. 30). The left hand side of Fig. 30 shows Séguy's fig. 96. Since there is only one slide (no. 292) of *P. ibalia* in MNHN this slide must have been used to prepare the figure, where the genital parts are seen from the right side. The right hand side of Fig. 30 shows Séguy's fig. 97. Since this figure shows the view of the cercus and pregonite from the right side I am fairly confident that it has been prepared from slide no. 294, where the genital parts likewise have their right side up towards the cover-slip. Slide 290, also prepared from *P. haeretica*, has the genital parts with their left side up towards the cover-slip. Séguy's fig. 97 shows a profile view at very high magnification (about 300x) of the extremely dense bundle of brownish setulae on the tip of the cercus in *P. haeretica* (similar to the one shown in Figs. 4–6), whereas fig. 96 shows the dramatically less dense vestiture on the tip of the cercus in *P. ibalia*, at a similar very high magnification. The 1934 figures are much less accurate, rather like small sketches, and the 1941a figures (Séguy 1941a: 23, figs. 19, 21) even less detailed. Admittedly they render the bundle of setulae in *P. haeretica* more dense than in the corresponding figure for *P. ibalia*, but not dramatically so, leaving the reader in the dark as to which one to go for. Unfortunately, Séguy never presented a dorsal (posterior) view of the cerci of *P. haeretica* or of *P. ibalia*, to document how the tips look under an ordinary stereomicroscope at moderate magnification.

Shape of the tip of the cerci. Séguy (1934: 50; 1941a: 22) described the tip of the cerci ("[f]orceps internes") of *P. ibalia* as "brusquement tronqués à l'apex ...". This is difficult to reconcile with the actual shape of the cerci as seen in dorsal (posterior) view with an ordinary stereomicroscope (Figs. 19, 21, 28). Under such an instrument the cerci of *P. ibalia* appear rather acute in dorsal view, whereas in *P. haeretica* they appear truncated at the tip (Figs. 4, 6). However, the illustration of the cercal tip of *P. ibalia* as figured in Séguy (1930: 96, "fe") (Fig. 30, left-hand side) has been drawn at a very high magnification (about 300x) from the right cercal tip of the genitalia mounted on slide no. 292 in MNHN. In this slide the tip gives the impression of being abruptly truncated, but this is somewhat misleading, since the genital capsule has been flattened and the cercal tip partly twisted during the preparation of the Canada-balsam mounted slide and is not seen in dorsal view. However, the slightly oblique view of the tip of the cerci shown in Fig. 28 displays a truncation similar to the one in Séguy's fig. 96 (Fig. 30, left-hand side).

Monophyly and relationships of the *Pollenia haeretica* species-group. The *P. haeretica* species-group is possibly monophyletic on account of the very broad male frons, a unique feature among Palaearctic *Pollenia*. Its closest relatives are not easy to determine. A black body where all thin curly setulae are black

(thus with no or almost no white or golden *Pollenia setulae*) is a feature shared with many specimens of *P. venturii* Zumpt, but the latter has a very different aedeagus. An ornamentation of the tip of the male cerci is a feature shared with *Pollenia leclercqiana* (Lehrer), but I have assigned this species to a *Pollenia amentaria* species-group (Rognes 1992b) because of the higher number of marginal scutellar setae (5–6) and a rather different aedeagus, which is identical to the one in *P. amentaria* (Scopoli), *P. moravica* (Jacentkovský) and *P. vera* Jacentkovský. Lehrer (1963, 1967) grouped *P. haeretica* and *P. ibalia* together with *P. vagabunda* (Meigen) and *P. contempta* Robineau-Desvoidy in the same subgenus (variously named *Séguyiomyia* Lehrer or *Trichopollenia* Enderlein, subordinated to different genera in the two papers), but gave no arguments in favour of this view. None of the synapomorphies shared by the species in the *P. vagabunda* species-group, viz. the male cerci bent backwards in distal 2/5, presence of 2 inner *ph*, and a tendency to develop supplemental setae in front of the 3 usual *h*, are present in *P. haeretica* or *P. ibalia*. Furthermore, the ventral plate is much longer in the *vagabunda* species-group members (compare with illustrations in Rognes 1992a) and the number of scutellar marginals lower (usually only 3, cf. Rognes 1992a). I therefore reject Lehrer's view.

The systematic position of *Pollenia funebris* Villeneuve. The description of *P. funebris* (Villeneuve 1933: 284–285) is quite detailed and I believe it refers to a species in the *P. haeretica* species-group. Villeneuve describes the frons as broad (“[y]eux un peu distants”), noticed the very scarce amount of *Pollenia setulae* (“revêtement laineux grisâtre a peu près nul, même sur les pleures”) and described the characteristic pattern of dusting of the abdomen shifting along a middorsal line. Regarding the genitalia, he described only the surstyli and in these terms: “... : paralobes un peu amincis, arqués l'un vers l'autre dans leur portion distale, et hérissés, tant sur leur face interne que sur leur face externe, de nombreux cils noir et raides, sans onguicule ni villosité.” This description may fit the surstyli of *P. haeretica*, but I think it very unlikely that Villeneuve would not have noticed the presence of the conspicuous and very dense brush of setulae on the tip of the cerci, had he had this species before him. Since he does not describe the cerci at all for his new *Pollenia* species it may not have been particularly noteworthy, which is the reason why I think the *P. funebris* syntypes (which have not been located and are possibly lost) belong to the taxon *P. ibalia* Séguy. The five syntypes were captured in Morocco, a fact also suggesting that the name is a synonym of *P. ibalia*. Villeneuve notes variation among his specimens of *P. funebris* concerning the cell r_{4+5} , which is found to be open, but closed or even short petiolate in small specimens. He dismisses this as having no taxonomic importance: “Cette disposition anormale n'est pas très rare chez beaucoup de *Larvaevoridae*; les anciens auteurs y voyaient soit des espèces, soit des genres nouveaux, ce qui était excusable à leur époque; mais il est plus regrettable de voir certains auteurs de notre temps croire à la fixité absolue des caractères ici, ...” (Villeneuve 1933: 285). The same variation is found in *P. ibalia*.

Acknowledgements

Many thanks to Nigel Wyatt (BMNH), Pierfilippo Cerretti (CNBF), Christophe Daugeron (MNHN), Hans-Peter Tschorsnig (SMNS), Vera Richter (ZIN) and Thomas Pape (ZMUC) for loan of material in their care; to Neal Evenhuis (Honolulu) for help with dating a Villeneuve paper; and to Jim O'Hara (CNC) for xerox-copies of pages from Fabricius's 1794 work and discussion of bibliographic details concerning Robineau-Desvoidy's work from 1830. Adrian C. Pont (Oxford) kindly provided a list of Villeneuve types present in IRSNB almost 20 years ago. Jim O'Hara (CNC), Patrick Grootaert (IRSNB), the late Loïc Matile (MNHN), Eliane De Coninck (MRAC), Chris Thompson and Norm Woodley (USNM) and F. Sick (ZMUK), kindly helped with information on Villeneuve types in the collections in their care. Institut Scientifique [formerly Institut Scientifique Chérifien], Rabat, Morocco, kindly granted permission to reproduce Séguy's original figures (republished here as Fig. 30).

References

- Capinera, J.L. 2006. Featured Creatures. [Information on beet armyworm, *Spodoptera exigua* (Hübner) from the University of Florida, Institute of Food and Agricultural Sciences, Department of Entomology and Nematology; http://entnemdept.ifas.ufl.edu/creatures/veg/leaf/beet_armyworm.htm (accessed 2 October 2009).]
- Fabricius, J.C. (1794) *Entomologia systematica emendata et aucta. Secundum classes, ordines, genera, species adjunctis synonymis, locis, observationibus, descriptionibus*. Tom. IV. C.G. Proft, Fil. et Soc., Hafniae [= Copenhagen]. [6] + 472 + [5] pp.
- Grunin, K.Ya. (1970) New species of Calliphoridae (Diptera) for the fauna of the USSR. *Entomologicheskoe obozrenie*, 49, 471–483. [In Russian.] [English translation entitled “Flies of the family Calliphoridae (Diptera) new to the USSR” in *Entomological Review, Washington*, 49, 282–289, also seen.]
- International Commission on Zoological Nomenclature (1999) *International Code of Zoological Nomenclature. Fourth edition adopted by the International Union of Biological Sciences*. International Trust for Zoological Nomenclature, London. xxix + 306 pp.
- Lehrer, A.Z. (1963) Études sur les Diptères Calliphorides. I. – La classification des Polleniinae palearctiques et leur dispersion en Roumanie. *Bulletin et Annales de la Société Royale d'Entomologie de Belgique*, 99, 285–310.
- Lehrer, A.Z. (1967) Études sur les Diptères calliphorides. II. Revision de la nomenclature de la tribu Polleniini. *Bulletin et Annales de la Société Royale d'Entomologie de Belgique*, 103, 255–259.
- Robineau-Desvoidy, J.B. (1830) Essai sur les Myodaires. *Mémoires présentés par divers Savan[t]s à l'Académie royale des Sciences de l'Institut de France, et imprimés par son ordre: sciences mathématiques et physiques*, Sér. 2, 2, 1–813.
- Note. In the printed work the spellings “savans” and “savants” both occur. The spelling with a “t” is present on the blue cover of the Smithsonian copy scanned for the Biodiversity Heritage Library (cf. <http://www.biodiversitylibrary.org/creator/7377>) and also on the identical “vue” 1 “sur 822” of the edition scanned for the Bibliothèque nationale de France (BnF) (cf. <http://gallica.bnf.fr/ark:/12148/bpt6k3307g.image.f1.langFR>), apparently a black and white scan of the same cover. The spelling “savans” occurs on the two subsequent “Mémoires ...” title pages, and on the bottom of every eighth page in the main text, as part of the expression “2. Savans étrangers.”. The phrase “et imprimés par son ordre:” is usually considered extraneous to the title of the series and not cited, but the Bibliothèque nationale de France (BnF) considers it an integral part of the title, and this opinion is followed here (cf. <http://gallica.bnf.fr/ark:/12148/cb328135052/date>). It is present on “vue” 1 and “vue” 5 “sur 822” in the cited volume. In the expression “2. Savans étrangers.” at the bottom of every eighth page the words “Savans étrangers” are an abbreviation for the “Mémoires des Savans étrangers”, a term often used for and equivalent to the “Sér. 2.”. The number preceding the text, here “2”, refers to the volume in that series. Thus “2. Savans étrangers.” = “Sér. 2, volume 2.” [literally “volume 2 of Sér. 2”].
- Robineau-Desvoidy, J.B. (1863) *Histoire Naturelle des Diptères des Environs de Paris*, 2, 1–920.
- Rognes, K. (1987a) A new species in the *intermedia*-group and a new synonym in the genus *Pollenia* Robineau-Desvoidy, 1830 (Diptera: Calliphoridae). *Systematic Entomology*, 12, 381–388.
- Rognes, K. (1987b) The taxonomy of the *Pollenia rudis* species-group in the Holarctic Region (Diptera: Calliphoridae). *Systematic Entomology*, 12, 475–502.
- Rognes, K. (1988) The taxonomy and phylogenetic relationships of the *Pollenia semicinerea* species-group (Diptera: Calliphoridae). *Systematic Entomology*, 13, 315–345.
- Rognes, K. (1991a) Blowflies (Diptera, Calliphoridae) of Fennoscandia and Denmark. *Fauna entomologica Scandinavica*, 24, 1–272.
- Rognes, K. (1991b) Revision of the cluster-flies of the *Pollenia viatica* species-group (Diptera: Calliphoridae). *Systematic Entomology*, 16, 439–498.
- Rognes, K. (1991c) Revision of the species of *Pollenia* Robineau-Desvoidy described by Camillo Rondani (Diptera: Calliphoridae). *Entomologica scandinavica*, 22, 365–367.
- Rognes, K. (1992a) Revision of the cluster-flies of the *Pollenia vagabunda* species-group (Diptera: Calliphoridae). *Entomologica scandinavica*, 23, 95–114.
- Rognes, K. (1992b) Revision of the cluster-flies of the *Pollenia venturii* species-group with a cladistic analysis of Palaearctic species of *Pollenia* Robineau-Desvoidy (Diptera: Calliphoridae). *Entomologica scandinavica*, 23, 233–248.
- Rognes, K. (2002). Blowflies (Diptera: Calliphoridae) of Israel and adjacent areas, including a new species from Tunisia. *Insect Systematics and Evolution*, Supplement 59, 1–148.
- Rognes, K. (2009) Revision of the Oriental species of the *Bengalia peuhi* species-group (Diptera, Calliphoridae). *Zootaxa*, 2251, 1–76.
- Rognes, K. (In press) Diptera, Calliphoridae. In: Cerretti, P. (ed.), Arthropods of southern Sardinia – a monograph.
- Note. Originally planned for publication in 2007 and resulting from the project “Safeguard and environmental

protection of the forest ecosystem of community importance of Marganai (Sardinia)". The project was sponsored by the Italian Ministero delle Politiche Agricole Alimentari e Forestale and led by the Corpo Forestale dello Stato, CNBF – Centro Nazionale per lo Studio e la Conservazione delle Biodiversit Forestale Verona – Bosco della Fontana.

- Rognes, K. & Baz, A. (2008) A new species in the *Pollenia viatica* species-group from Sierra de Guadarrama, Spain (Diptera: Calliphoridae). *Studia dipterologica*, 14 [2007], 389–395.
- Schumann, H. (1986) Family Calliphoridae. In: A. Soós & L. Papp (eds.), *Catalogue of Palaearctic Diptera*. Volume 12 Calliphoridae – Sarcophagidae. Akadémiai Kiad, Budapest, pp. 11–58.
- Séguy, E. (1928) Étude sur le *Pollenia Hasei*. *Zeitschrift für Angewandte Entomologie*, 14, 369–375.
- Séguy, E. (1930) Contribution l'étude des Diptères du Maroc. *Mémoires de la Société des Sciences Naturelles du Maroc*, 24, 1–207.
- Séguy, E. (1934) Contribution l'étude du genre *Pollenia* R.-D. *Revue française d'Entomologie*, 1, 44–51.
- Séguy, E. (1941a) Études sur les mouches parasites. Tome II. Calliphorides. Calliphorines (suite), Sarcophagines et Rhinophorines de l'Europe occidentale et méridionale. Recherches sur la morphologie et la distribution géographique des Diptères larves parasites. *Encyclopédie Entomologique, Série A*, 21, 1–436.
- Séguy, E. (1941b) Récoltes de R. Paulian et A. Villiers dans le haut Atlas marocain, 1938 (XVII^e note) Diptères. *Revue française d'Entomologie*, 8, 25–33.
- Séguy, E. (1953) Diptères du Maroc. *Encyclopédie entomologique, Série B, II, Diptères*, 11, 77–92.
- Szpila, K. (2000) Three species of Calliphoridae (Diptera) new to the Polish fauna. *Polskie Pismo Entomologiczne*, 69, 355–361.
- Szpila, K. (2003) First instar larvae of nine West-Palaearctic species of *Pollenia* Robineau-Desvoidy, 1830 (Diptera: Calliphoridae). *Entomologica Fennica*, 14, 193–210.
- Szpila, K. & Draber-Mońko, A. (2008) *Pollenia moravica* (Jacentkovský, 1941) (Diptera: Calliphoridae) recorded from Poland for the first time. *Fragmenta faunistica*, 51, 139–142.
- Villeneuve, J. (1933) Descriptions de Myodaires supérieurs du Nord africain. *Bulletin de la Société entomologique de France*, 37 [1932], 284–286. [Published 18.i.1933]
- Zumpt, F. (1956) 64i. Calliphorinae. *Die Fliegen der Palaearktischen Region*, 11, 1–140 (Lieferungen 190, 191, 193). Schweizerbart, Stuttgart.